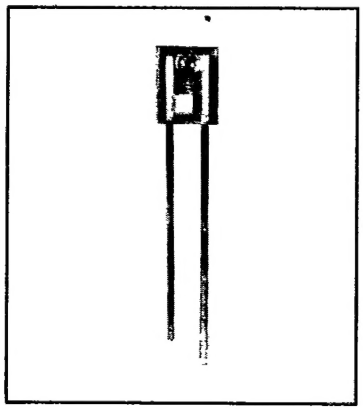
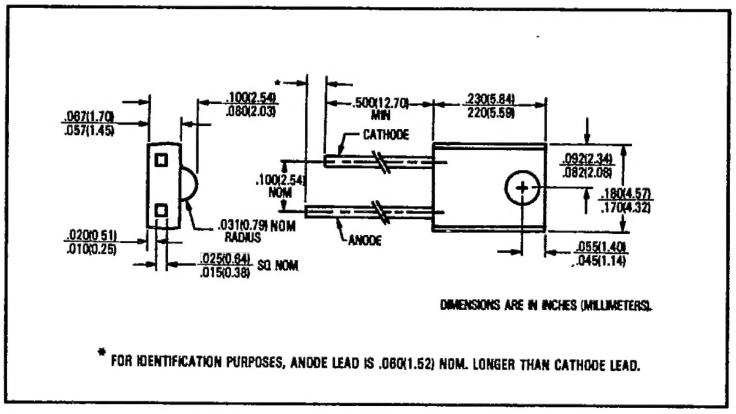
Optoelectronics Division
TRW Electronic Components Group

Product Bulletin 5063
January 1985

GaAlAs Plastic Infrared Emitting Diodes
Types OP240SL, OP240SLC, OP240SLB, OP240SLA





Features
- Up to 2.5 times the radiant intensity of the GaAs equivalent at the same drive current
- Selected to specific on-line intensity and radiant intensity ranges
- Mechanically and spectrally matched to the OP550 series of phototransistors and the OP560 series of photodarlingtons

Description
The OP240SL series consist of gallium aluminum arsenide infrared emitting diodes mounted in low cost, clear plastic side-looking packages. Gallium aluminum arsenide features a significant increase in the radiated output of gallium arsenide at the same forward current. Also, with a wavelength centered at 875 nanometers, it more closely matches the spectral response of silicon phototransistors. For additional information on spectral emission characteristics, please refer to the OP550 data sheet.

The OP240SL is equivalent to TRW's earlier part number OP240.

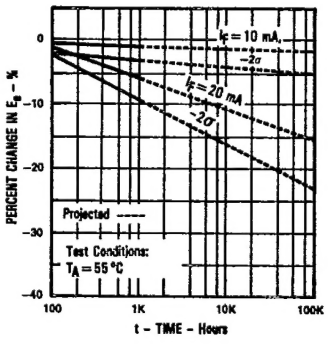
Absolute Maximum Ratings (T_A = 25°C unless otherwise noted)

Reverse Voltage	2.0 V
Continuous Forward Current	50 mA
Peak Forward Current (Pulse Width = 1 μsec., 300 pps)	3.0 A
Storage and Operating Temperature Range	−40°C to +100°C
Lead Soldering Temperature (1/16 inch [1.6 mm] from case for 5 sec. with soldering iron)[1]	240°C
Power Dissipation	100 mW[2]

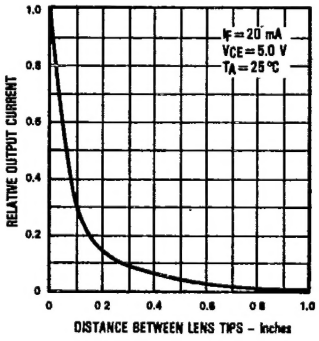
Notes:
(1) RMA flux is recommended. Duration can be extended to 10 seconds max. when flow soldering.
(2) Derate linearly 1.33 mW/°C above 25°C.
(3) $E_{e(APT)}$ is a measurement of the average apertured radiant incidence upon a sensing area 0.180" (4.57 mm) in diameter perpendicular to and centered on the mechanical axis of the lens, and 0.653" (16.6 mm) from the lens tip. $E_{e(APT)}$ is a measurement of the average radiant intensity within the cone formed by the above conditions. $E_{e(APT)}$ is not necessarily uniform within the measured area.

Typical Performance Curves

Percent Changes in Radiant Intensity vs Time



Coupling Characteristics of OP240SL and OP550



Types OP240SL, OP240SLC, OP240SLB, OP240SLA

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Electrical Characteristics (T_A = 25°C unless otherwise noted)

Symbol	Parameter		Min.	Typ.	Max.	Units	Test Conditions
PO	Radiant Power Output	OP240SL		1.0		mW	I_F = 40 mA
$E_{e(APT)}$[3]	Apertured Radiant Incidence	OP240SL	0.050			mW/cm²	I_F = 20 mA
		OP240SLC	0.20		0.86	mW/cm²	I_F = 20 mA
		OP240SLB	0.40		1.20	mW/cm²	I_F = 20 mA
		OP240SLA	0.60			mW/cm²	I_F = 20 mA
V_F	Forward Voltage				1.80	V	I_F = 20 mA
I_R	Reverse Current				100	μA	V_R = 2.0 V
λp	Wavelength at Peak Emission			875		nm	I_F = 20 mA
B	Spectral Bandwidth Between Half Power Points			80		nm	I_F = 20 mA
Δλp/ΔT	Spectral Shift with Temperature			+0.18		nm/°C	I_F = Constant
θ_{HP}	Emission Angle at Half Power Points			40		Deg.	I_F = 20 mA
t_r	Output Rise Time			550		ns	$I_{F(PK)}$ = 20 mA, PW = 10.0 μs, D.C. = 10.0%
t_f	Output Fall Time			225		ns	

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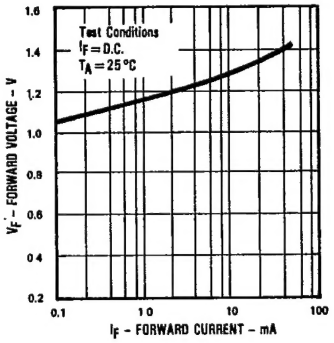
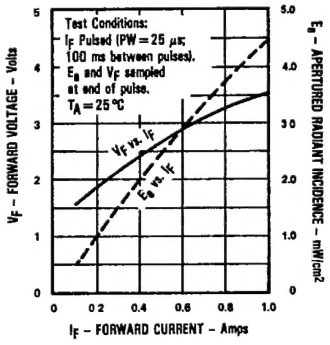
Typical Performance Curves

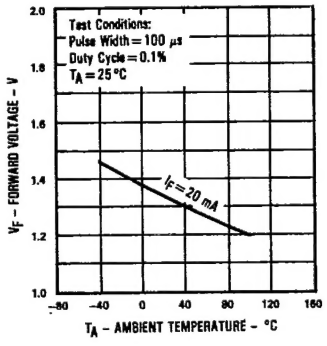
Forward Voltage vs Forward Current



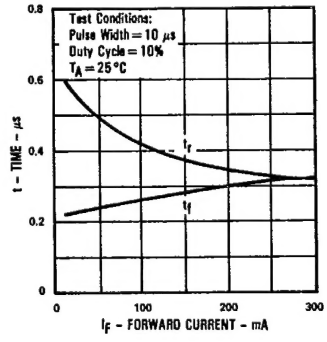
Forward Voltage and Radiant Incidence vs Forward Current



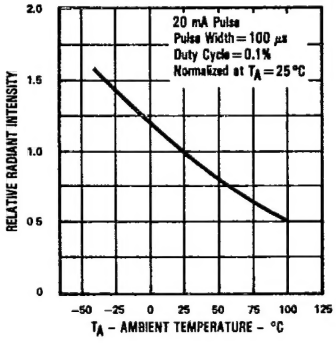
Forward Voltage vs Ambient Temperature



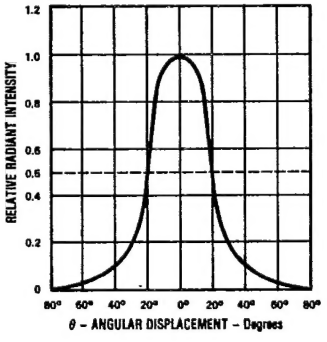
Rise Time and Fall Time vs Forward Current



Relative Radiant Intensity vs Ambient Temperature



Relative Radiant Intensity vs Angular Displacement



TRW reserves the right to make changes at any time in order to improve design and to supply the best product possible.

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